

Materials Science

NEW SUPRAMOLECULAR CATALYTIC SYSTEM FOR EPOXIDATION

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The goals of my research were to synthesize and characterize a molecular cube with the purpose of encapsulating the Mn (V) catalyst for epoxidation.

Encapsulation of the catalyst would extend its lifetime by protecting it from oxidation by other catalysts as well as inducing selectivity based on size. The procedure used was to synthesize a salen ligand for the sides of the cube and then connect the ligands with metal corners to form a cube. A molecular cube with platinum corners (cis (PEt₃)₂Pt(OTf)₂) and salen ligand, complexed around 1,2,4,5-benzenetetramine, sides was synthesized. ¹H NMR and ³¹P NMR have shown that the structure is symmetrical. Further studies including mass spectrometry, infrared spectrometry, and crystallography are being done to show the symmetrical structure is in fact a cube.